Evaluating Texas' Success in Providing AP Access to Disadvantaged Students

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The University of Texas at Austin

May 2020

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Acknowledgements

I would like to thank Dr. Rose for helping me tirelessly throughout this research process, and Dr. Fulton for providing critical feedback as my work started to come together. Thank you to Dr. Green for providing such a supportive environment for all the honors students to succeed. Lastly, thank you to my family and friends for their support and love over the past four years, and especially the past two semesters as I took on this thesis.

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Abstract

College is a valuable resource often vital for upward mobility. As college becomes more common, so, too, does the issue of access. The literature shows that passing AP exams is an indicator of future success in post-secondary education. AP courses that properly prepare students for AP exams are not equally accessible to high school students, though, especially for minority and disadvantaged students. I decided to evaluate what access to AP courses looks like in Texas, specifically by disadvantaged student status. To do this, I compared AP exam participation in high schools by student type, and then further compared those AP participation rates to SAT and ACT exam participation in high schools. I found that disadvantaged student populations take AP exams at a lower rate than their peers, and AP exam participation is generally positively correlated to entrance exam participation. AP courses that prepare students for success on AP exams can positively impact students' college readiness. As such, they should be made more accessible, especially to disadvantaged students.

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Chapter 1

INTRODUCTION

My Interest

I graduated with 48 peers from a rural high school in a small town in West Texas. My brother and I both attended the University of Texas at Austin (UT), but nobody else I knew from my high school ever joined us in becoming Longhorns. Even after 4 years at UT, I am still surprised when my peers mention seeing high school friends around campus or being actively involved in the same friend groups from high school. I am also often impressed by the number of credits my peers came into college with, whether due to the multiple Advanced Placement (AP) or International Baccalaureate (IB) exams they took or the plethora of dual-enrollment options they had. I did not know what IB was until I got to UT, and my high school only had about 4 AP course offerings.

Learning that many of my peers had rigorous high school experiences made me think about my high school experience. Why did people from my high school so rarely come to UT? Why was everyone so impressed when I got over a 30 on my American College Testing (ACT) exam? Why did my college peers have so many more experiences that helped them easily adjust to the rigor of a competitive research university, while I scrambled trying to figure out how to be a college student? I was fortunate to have a mom who always pushed me to be my best, but in high school, it was incredibly easy to excel. There were few challenges. Transitioning to college life was difficult for me, and I am much more privileged in a lot of ways than many students aspiring to get a bachelor's degree. These questions and more led to me wanting to know more about college access for disadvantaged students. I started to wonder how my state is helping young people succeed who have very little means to help themselves.

The Issue

In the last 50 years, college attainment has greatly increased as more and more students aspire to obtain 2- and 4- year degrees (Holland 2014). This can largely be attributed to the increase in minority enrollment. Of the 6 percent increase in undergraduate enrollment from 2007 to 2008, "almost three-quarters of it came from minority freshman enrollment growth," (Taylor et. al 2010:1). Students are taught that a college degree is necessary to have a successful career in today's society (Venezia and Kirst 2005), because college is a valuable asset for upward mobility. Unfortunately, college is not equally accessible to all prospective undergraduate students. Finding a well-suited college is rarely a straight-forward process, since students that hope to attend college often do not have a grasp of the nuances of the college application process. Enormous barriers present themselves to many, but some of these struggles are unique to disadvantaged students since other students have social, economic, and cultural capital to turn to when working through the college admission process.

The disadvantaged student population is disproportionately students of low socioeconomic status, minority students, and first-generation college students. These students have less knowledge and capital than many of their peers, so high schools might be the only resource disadvantaged students have to close gaps in capital. There are many resources high schools can provide to help students reach their post-secondary goals. One resource that can positively impact college readiness is AP courses. These courses give students a chance to experience rigorous coursework and see their capabilities in a college-level environment. Access to AP courses that adequately prepare students for success on AP exams is limited, though. With a lack of consistency amongst high school AP courses in mind, I ask: are high schools effectively providing resources that can increase college readiness for disadvantaged students?

LITERATURE REVIEW

Areas of Concern in the College Application Process

Students attending a college "with selectivity levels that [match] their qualifications" are attending what can be considered a "college match" (Roderick, Coca, and Nagaoka 2011:179). In many areas and for many reasons, students struggle to successfully find and attend a college match. These areas include having a lack of information on the college application process, having a gap between what high school prepares students for and what colleges expect students to know, and taking appropriate classes in high school.

The college application process is taxing. There are essays to write, exams to take, and decisions to make. Studies have shown that providing students with adequate information on the college application process makes it more likely that students will apply to and enroll in college (Wong 2017). Naffgizer and Rosenbaum (2009) studied a population of disadvantaged students as they applied to college. They found that disadvantaged students have trouble seeing pros and cons of various colleges, choosing schools that fit their interests and needs, and identifying attributes valued in the admission process and how to present those desirable attributes. Students also might not understand how financial aid works. They might feel like an expensive college is unattainable for them, despite being well-qualified, because they are unaware of the high likelihood that they will be given aid should they attend that university. These students might also choose to stay closer to home despite possible advantages of a college that is further away, or they might spend a lot of time writing an essay for non-selective colleges.

Students who do not have access to people who can give them this vital information throughout the admission process simply struggle to present themselves as the qualified candidate that they are. "Students— especially those who are economically disadvantaged or

whose parents did not attend college often do not know what colleges expect of them in terms of meeting their admission requirements" (Venezia and Kirst 2005:286). This lack of information can be detrimental to a student's chances of getting into a college that is well-suited to their abilities and career goals.

In the transition from high school to college, many aspiring college students realize that they are not, in fact, prepared for college. College readiness is defined by Conley as "the level of preparation a student needs in order to enroll and succeed- without remediation- in a credit-bearing general education course at a postsecondary institution..." (2007:5). Venezia and Kirst (2005) found that students often think graduating high school is all that is needed to be successful in college, but then they arrive at college and are placed in remedial courses. Remedial courses are those which do not count towards a degree but are required before one can begin earning credit in a specific discipline. This lack of college-readiness can lead to stress, financial strain, and even dropping out of college (Venezia and Kirst 2005).

Given that being prepared for college is a decisive factor in a student's success in college, and that there is no universal understanding of what this level of preparation looks like, Conley (2007) developed a system to define areas of preparation that are vital for student success. Attributes required for college readiness include: key cognitive strategies, such as critical thinking and problem solving; academic knowledge and skill, most centrally writing and research; academic behaviors such as self-monitoring and mastery of study skills; and contextual skills and awareness, most notably "college knowledge" or an understanding of how to get accepted to and excel in post-secondary institutions, which is correlated to socio-economic status.

These attributes must be developed throughout a student's high school years, which is why the resources high schools can provide are so important. Students who have not properly developed these attributes will have a harder time adjusting to the rigor and expectations of post-secondary education. Furthermore, a study by Attewell et al. (2006:899) found that 52% of students "in the lowest quartile of socioeconomic status" took remedial courses as opposed to 24% in the highest SES quartile; high proportions of remedial courses disproportionately affect disadvantaged students during their post-secondary careers.

Finally, many researchers have found that the classes taken by students have an impact on what information is provided to these students, their preparedness for college, and their success in attending an appropriate college. Clarke and Gelatt (1967) found that students feel pressured to take the best classes so that they can be competitive candidates for higher-tier colleges; sometimes, though, these students are not prepared for the heavy course load and would be better suited to lower-level classes. In this endeavor, students might ruin their GPA and thus chances of getting into a lower tier but more appropriate college.

Furthermore, teachers and counselors do not give all students the same information. Students in AP, honors, or college prep courses are more likely to hear about and be encouraged to apply to college. They are also more likely to talk with their teachers or counselors about college admission policies (Venezia and Kirst 2005). Evidence shows that teachers expect less of minority students regarding academic achievement. Similarly, lower-income schools have a greater student to counselor ratio, leaving less time for counselors to keep up to date with college admissions procedures and get to know their students well enough to properly aid in that process (Wong 2017). Lastly, Woodruff and Ziomek (2004) found that high school GPAs have increased steadily throughout the years, but ACT exam scores have not shown that same increase in

success. This inconsistent increase between GPAs and ACT success emphasizes the gap between high school success and post-secondary institutions' expectations. High schools are indicating that their students are doing better, but scores for a common a benchmark of college readiness are not consistent with that increase in high school student success.

Proven Methods of Successful Aid in the College Application Process

Research has shown that students, particularly disadvantaged students, struggle with applying to colleges in the areas discussed, and many more. With an increased interest in college education comes greater competition for admittance. Wolniak et al. (2016:1) found that students of higher socio-economic status are more likely to adjust to the higher demands "particularly when confronted with increasing postsecondary access of students from all backgrounds" by taking part in various college enhancement strategies. This easier adjustment to increasing expectations is tied to their "superior academic preparation… attendance at higher performing schools, and relative abundance of social, cultural, and financial resources." This adaptation by already advantaged students further perpetuates the class divide and stratification. For students who do not have the same abundance of resources, provision of these resources by their high schools might be their only real chance at successfully matriculating into a college well-suited to their abilities. There are various measures that high schools can take to make students' transitions from high school to college more successful such as providing college counseling, "cultural capital translators", and a positive college-going culture.

College counselors are counselors in high schools who are up-to-date on relevant information surrounding the college application process (such as deadlines and taking ACT/SAT exams), are well-versed in filling out documents such as the FAFSA, and know a lot about what nearby colleges look for in applicants. High school counselors are recommended at a 250:1

student to counselor ratio. This ratio would give each counselor enough time to form more personal relationships with students which is essential for helping each student find a college match. Having a smaller student to counselor ratio would also allow counselor the necessary time to stay up to date on college application information.

Public high school counselors spend less than 25% of their time on college-counseling related work, and data show that "students of color and low-income students bear the greatest costs of counseling understaffing," since the student to counselor ratio increases as low-income or minority student populations increase (Wong 2017). Poynton and Lapan (2017:375) found that "school counselors who met more frequently with students to provide college- and career-readiness counseling services enhanced students' social capital networks and promoted the learning of instrumentally useful skills connected to more successful transitions to postsecondary education." Venezia and Kirst (2005:290) framed counselors as potential "purveyors of information… about what students need to know and be able to do to succeed at postsecondary education." Counselors who specialize in college-access counseling are a vital and drastically underutilized resource that might be disadvantaged students' only source of information on the college application process.

In their research, Naffgizer and Rosenbaum (2009:0) develop the term "'cultural capital translators,' [or staff who] help students acquire subtle, taken-for-granted information and skills that colleges require, and help them overcome barriers to college-related activities…much of their time is spent explaining aspects of the college process which are well-known to middle-class students." These translators help students overcome cultural barriers such as: seeing pros and cons of various colleges, choosing schools that fit students' interests and needs, and knowing how to present attributes valued in the admissions process. In the study, translators helped

disadvantaged students apply to college and findings were discussed by explaining what questions students posed and how the translators helped them.

Students in this study had misconceptions about the college application process. Naffgizer and Rosenbaum (2009) point out that many middle-class observers would have difficulty even imagining these misconceptions could arise. Challenges that arose included using a gang email on a college application, not understanding the importance of a prestigious award, or, as previously discussed, not understanding that the "ticket-price" of a college is not the amount students will be expected to pay. They further discuss the importance of conceptualizing this information as cultural capital, since middle-class students often do not need someone to clarify these things. Many misconceptions made by these students are tied to "meaning and value which is closely tied to access to opportunity" (p. 18). The researchers close their study by stating the importance of providing more resources to students in order to improve college access.

Finally, college-going culture greatly impacts a student's conception of post-secondary education and the likelihood that they will pursue it. Horng et al. (2013) conducted research on the National College Advising Corps, a program aiming to promote college access in the U.S. One of the program's goals is to "conduct outreach to underclassmen in an effort to improve the school-wide college-going culture," (p. 56). The researchers developed a typology for college-going culture. One element of this typology included if college-going is central to a school's mission, meaning going to college is a primary expectation. Roderick, Coca, and Nagaoka (2011) defined high schools with strong college-going cultures as those that have a pattern of students attending four-year colleges, teachers who expect and support students in their college endeavors, and high levels of applying for financial aid. They determined that students attending

high schools with strong college-going culture "are more likely to plan to attend, apply to, be accepted into, and enroll in a four-year college that matches their qualifications," (p. 178). High schools with a strong college-going culture give students more knowledge on how to prepare for entrance exams because counselors, teachers, and peers more frequently discuss preparation strategies.

College-going culture is also important for finding an appropriate college match. For example, community college might be the best fit for some students given their qualifications, resources, and experience. However, students may be averse to attending community colleges if their high school community is ill-informed about the advantages of beginning at a 2-year college perhaps due to them being "viewed with a stigma that [is] reinforced" by many teachers (Deil-Amen and Tevis 2009:165). Many students leave the possibility of community college out of the decision-making process. Students who ultimately attended community college, however, experienced a vast shift in their perceptions on these two-year institutions (Deil-Amen and Tevis 2009). Having a school-wide dialogue about going to college gets students to think about post-secondary education sooner and gives them a better chance at success.

Getting to college and doing well is not easy, and without proper help, for some students it might even be impossible. We have decades of research asserting the important role high schools can play in helping students reach their education-related goals, and yet, disadvantaged students are perpetually left behind. Roderick, Coca, and Nagaoka (2011) concluded that high schools are a vital source for students (especially for those with less available social capital) now that enrolling in college is nearly twice as common of an aspiration. With this statistic in mind, they ask, "What will it take to transform high schools from institutions that prepare a select

group of students for college enrollment to institutions that prepare the majority of their students for this goal?" (p. 202).

College Access and Readiness in Texas

In 1997, Texas House Bill 588 was passed, requiring all state-funded universities to automatically admit the top 10% of graduating high school seniors. This law came as an alternative to Affirmative Action, with the goal of diversifying racial, ethnic, socio-economic, and geographic populations and increasing postsecondary access across the state (Niu, Tienda, and Cortes 2006). Recent studies evaluate the effectiveness of this Top 10% rule, as it is commonly known, in achieving these greater levels of diversity.

Daugherty, Martorell, and McFarlin (2014) found that the state's most-advantaged high schools showed greater access to the state's flagship universities (Texas A&M and The University of Texas at Austin) as a result of the automatic admission policy. They also found that the schools with low college-sending rates experienced little to no impact by the Top 10% rule, leading them to conclude that "offering eligibility for automatic admission may not be effective at accomplishing even the narrow goal of increasing access to the top public universities for students in the most-disadvantaged settings." Watson and Satija (2016) reported, however, that the Top 10% rule appears to have increased diversity at A&M, and Satija (2017) reported that the rule hasn't done much for black students at UT Austin, but has a significant impact on Hispanic students.

Beyond admission policies is the issue of college readiness. Implementation of End of Course exams (EOCs/STAARs) began in 2009 in response to Executive Order RP53 which called for more college-readiness programs in the state. The state defined college readiness as

"'the level of preparation a student must attain in English language arts and mathematics courses to enroll and succeed, without remediation, in an entry-level general education course for credit in that same content area' at a general academic teaching institution or an institution that offers associate degrees or certificates" (Texas Education Agency n.d:I-3). Defining college-readiness is a first step towards standardizing postsecondary preparedness across the state, and the STAAR exams may eventually succeed in achieving higher levels of college readiness. STAAR exams, defining college readiness, and Texas House Bill 588 are great starts, but there is a lot of progress still to be made surrounding college readiness and college-access for disadvantaged students in Texas.

Chapter 2

FURTHER RESEARCH

I initially asked a variety of questions while doing my research. Ultimately, I narrowed my focus to AP, ACT, and Scholastic Aptitude Test (SAT) exams, since I had data sets about these standardized exams' scores and participation rates for high schools in Texas. I began to ask what these data could tell us about post-secondary access and college readiness, especially for disadvantaged students.

The Importance of AP Courses

AP exams are taken each year by high school students across the United States and internationally and, for students scoring a 3 or higher, college credit may be rewarded for representing mastery of the content in a particular subject. AP courses are taught in a high school classroom, and often, students take an AP exam for that subject at the end of the school year. Other students take AP exams without having taken a specifically designated 'AP' course in that subject, and others still take AP courses but not the AP exam.

AP courses across the US can differ in a variety of ways. For one, high schools offer different AP courses. Some schools have several AP courses in different subjects, while other schools might only have a handful of AP courses, or even none. Furthermore, quality of the AP course is dependent on the teacher's familiarity with the subject and the school's ability to provide such qualified teachers. Consequently, a student taking an AP course does not necessarily get exposure to the college-level content necessary to perform well on that subject's AP exam. What is good about AP exams, and where and for whom do issues arise?

Research has shown that success on AP exams is a significant predictor for a variety of positive outcomes in post-secondary education. Students participating in AP exams tend to enroll in 4-year institutions more frequently, have higher college GPAs and 4-year graduation rates, and earn more college credits (Chajewski 2011). Cisneros et al. (2014) also discussed how AP participation can lead to a greater likelihood of admission to college and better financial aid.

Chajewski (2011) discussed how some students might have a greater awareness of their academic potential after taking AP courses, which would motivate college preparation. Chajewski also found "an increase of 171% in the odds of attending a 4-year postsecondary institution associated with the completion of a single AP exam," (p. 24) and even more so for students taking 2 to 3 AP exams, proving that AP exam participation is a strong predictor of matriculation.

It is important to note that simply having AP courses is not enough. The most prominent correlations related to AP and collegiate academic success is found when students actually pass AP exams (Hallett and Venegas 2011). This distinction is especially salient when considering environments where AP courses are offered but AP exam participation is less consistent. As mentioned by Conley (2007), some students may take AP courses for the GPA boost without any intention of taking an AP exam. Judson and Hobson (2015) found that students are taking AP exams more frequently but are not necessarily passing or getting college credit at a proportionate rate. They also discuss high school environments where AP courses might be the only higher-level or honors courses, obligating higher-achieving students to take AP courses at a higher rate. Furthermore, they found that many AP course syllabi exempt students from taking a final exam in the course if they take the AP exam, regardless of how they perform.

Access to AP courses that prepare students for AP exams could be tied to demographic differences in student populations. Camara and Schmidt (1999) discuss gaps in admissions and other standardized test scores between students of different socioeconomic and ethnic groups. They determined that "inequitable access to high-quality education" (p. 1) is an influencing factor in these gaps. In their research, they discovered that small and rurally located high schools often lacked quality course offerings or even a substantial range for students to choose from. Hallett and Venegas (2011:485) emphasize that "school districts and state educational systems need to ensure all students in these classes are afforded the opportunity to learn from a qualified AP teacher and have access to a complete, high-quality curriculum."

Having a qualified teacher for AP courses is vital to providing a college-level course. Hallett and Venegas (2011) emphasized unprepared or unmotivated teachers as a factor in students' lack of success on AP exams. Students they talked to explained that some teachers were learning material with them, and often did not have the credentials to teach that subject. These issues are most prominently experienced by low-income school districts: "We had a great teacher the first semester, but the second semester we had a bad teacher because the other teacher was removed for budget cuts," (p. 482).

Cisneros et al. (2014) discuss the persistent issues faced by disadvantaged students and how access to AP courses can help mitigate these issues. For one, AP courses are tied to similar college persistence rates for "low- income and low-achieving students… [when compared to] their high-income, high-achieving peers." Cisneros et al. further explain how access to AP courses is limited for underrepresented students of color "because their schools either do n.ot offer AP courses or offer only a limited selection." Similarly, these underrepresented populations

might be in an environment that offers fewer AP courses due to less demand for those courses and greater need in other areas.

AP courses are clearly an important resource that provide students the opportunity to engage in college-level coursework, thus increasing college-readiness. Access to these courses correlates to better admission chances, greater belief in one's academic ability, higher college GPAs, and a variety of other benefits. Access to adequate AP courses remains an issue, though, as lower-income and minority-populous high schools struggle to keep teachers who are qualified to teach college-level coursework. Furthermore, the GPA boosts provided by AP courses are pushing students to take the courses and exams despite not being prepared for college level work. AP courses are an invaluable resource, but they are only helpful if they are both adequately taught and accessible.

College Entrance Exam Relevance

The SAT and the ACT are entrance exams required by most colleges for admission, although students can generally choose only to send one of the scores. Research into the exams and their accuracy in predicting college readiness has confounding results. Camara and Echternacht (2000:9) found that SAT results were an important predictor of college success, as "demonstrated through hundreds of validity studies." Hyman (2016) studied the impact made by states requiring entrance exams. Requiring these exams of all 11th grade students has a few positive results, such as giving students an idea of "their college-going ability" (p. 285) and bettering college-going culture at high schools.

Despite research supporting the use of standardized entrance exams, others have expressed the inequity of the exams. Alon and Tienda (2007:507) explain that "the emphasis on

test scores in college admissions notably benefits those with more resources and the power to influence how merit is defined, while disadvantaging others." Rothstein's analyses (2004) found that the SAT was not predictive of college students' freshman year GPA.

It is not clear if entrance exams are a predictor of college-readiness or aptitude. Regardless, entrance exam scores are a factor in many college acceptance decisions, even if they are weighted with less significance. Furthermore, participation in these exams indicate an interest in attending college, so studying participation rates can give insight into college-going intentions.

The literature has shown the positive impact good AP courses can have on college success. It has further shown the various ways in which access to these courses is limited, especially for disadvantaged and minority students. Despite the inconsistencies regarding the accuracy of SAT and ACT results in indicating college readiness, for their use as indicators of college-going intent, they remain relevant factors.

MY RESEARCH

With my research I hope to discuss how public high schools in Texas are providing resources to disadvantaged students in one area that impacts college readiness. Specifically, I want to analyze disadvantaged students' access to AP courses. Based on the data I had, I asked two questions: How does participation in AP exams differ between disadvantaged and not disadvantaged student populations? How does participation in AP exams correlate to participation in ACT or SAT exams? It is important to note that my analyses are done at the school level, rather than the student level. FERPA laws prohibit schools from making student-level data available to the public.

AP, ACT, and SAT exam participation is a small portion of many factors involved in a student's successful matriculation into college. Access to AP courses could reflect a high school's environment and tendency to provide adequate resources to students, as well as rigor of courses and equity of access to those courses for all students. This study will show how much disadvantaged students' access to AP courses differs from that of their peers in Texas high schools, and how that disproportionate access relates to their engagement in college entrance exams.

METHODOLOGY

My research focuses on access to AP courses and the correlation access to AP courses has with ACT and SAT exam participation. I specifically break down this impact based on the economically disadvantaged status of the students. Economically disadvantaged students, also referred to in my research as disadvantaged students, are defined as those who receive either free or reduced lunch. This analysis considers one resource high schools could provide students that would ultimately aid their college readiness.

Data

To do my analysis, I found several data sets from the Texas Education Agency's (TEA) website. School districts in Texas are required to provide data to TEA "about public education, including student demographic and academic performance…" (2019). TEA uses the Texas Student Data System to "modernize and improve the quality of data collection, management, and reporting in Texas education," (2019). I ultimately chose three data sets from TEA, one data set for each the SAT, the ACT, and the AP exams.[1]

These three reports are categorized by TEA as student data, or reports that assess student performance. They report data at the high school level, providing participation and performance information about each high school for each exam. For example, the ACT data set includes average scores for each subject, average composite scores, participation rates, critical rates, and so on, for the entire student population at each school. These data can be broken down further by student types to show how specific groups of students at each high school performed on the

[1] After completing my analyses, I realized that I used the most recent data sets, but they were not from the same school years. The AP data set is from the year after the SAT and ACT data sets. I discuss this issue further in my limitations.

exam. Student types include demographics such as race, ESL/bilingual status, economically disadvantaged status, immigrant status, and gifted status.

High schools are only included in each of these data sets if at least one student took that exam. High schools not included in the SAT data set reported that none of their students took the SAT. This holds true for the ACT data set as well. High schools not included in the AP data set might be those which do not offer AP courses at all, or they may be high schools where AP courses were offered but, ultimately, no students took an AP exam. Similarly, data were only reported for student types if at least one student of that demographic participated in the exam. If no students of a certain demographic at a high school took that exam, exam data for that student type were not reported. Since these data sets only include data on high schools if that high school had at least one student taking that exam, my analyses only select on schools with at least one student participating in each exam.

The SAT and ACT data sets report on students who were in 12th grade during the 2016-17 school year, while the AP data set reports on students who were in 11th and 12th grade during the 2017-18 school year. These data sets do not include individual student data, since those data are not available to the public. Therefore, I am only able to compare the greater populations of student types at each high school to other student types.

Variables

My outcome variables were SAT and ACT participation rates. I started with the SAT data set, coding each variable and checking number accuracy. Due to the Family Educational Rights and Privacy Act (FERPA), many numbers were masked, such as number of students taking each

exam or reaching a set critical rate. Participation rates were generally not masked, though, since they are percentages, so I focused on the reported participation rates for use in analyses.

While looking through my data, I came across cases where participation rates were missing. The data might have been missing because the school district did not report that number or because reporting the data could violate FERPA. I knew that these values were not true zeroes, though, because otherwise the high school would not have shown up in that data set. Since I was not able to ascertain what these missing participation rates really were, I removed them from the data set, choosing not to analyze those data. I repeated this process with the ACT data set.

My main predictor variable was AP participation rate. For this data set, AP participation means the percent of students who took 1 or more AP exams that year. I removed all cases with a missing participation rate, and then I transformed the rates in order to better analyze these data. I created 10 AP Participation Rate categories, the first category being from .01%-9.99% participation, and in 10% increments thereon. Finally, I coded the variables, keeping the codes consistent for identical variables across data sets. Table 1 shows the number of removed cases for each data set.

Table 1: Number of Removed Cases

Exam	Student Type	Number of Removed Cases
AP	Economically Disadvantaged	170
AP	Not Economically Disadvantaged	145
SAT	Economically Disadvantaged	11
SAT	Not Economically Disadvantaged	11
ACT	Economically Disadvantaged	6
ACT	Not Economically Disadvantaged	3

Another predictor variable was the aforementioned student type. I chose to break down participation rates by two student types: Economically Disadvantaged and Not Economically Disadvantaged, also referred to as Disadvantaged and Not Disadvantaged. My population for each data set became the disadvantaged students at each high school and the not disadvantaged students at each high school. I created two SPSS files for each exam, one with the disadvantaged student populations and the other with the not disadvantaged student populations, totaling six separate files. The AP data sets were to be used for analysis on their own, and then again after merging them with the SAT and ACT sets.

Once each data set was cleaned, coded, and transferred into SPSS documents, I began merging the sets so I could compare AP participation with SAT and ACT participation. I started with the SAT set containing the disadvantaged student type. I merged the disadvantaged AP data set with the disadvantaged SAT data set, matching the campus number between the two. Doing this allowed me to add AP Participation Rate as a new variable. Merging the data sets created a new category for AP participation: schools with 0% AP participation. These high schools reported student participation in the SAT but did not report participation in AP exams. I coded the new AP category to ensure those data were accounted for when running my analyses. This new category became the AP Zeroes.

After merging the data sets, a number of invalid cases were also created. These cases were high schools that reported students did not take the SAT but did take AP exams. Since the entrance exams are my dependent variables, these cases could not tell me anything and were not valid to be ran in my analyses. They were ultimately removed from the data set. The AP zeroes, likewise, are important to keep as a separate category because they could indicate trends about

high schools whose students are not taking AP exams and how those schools participate in entrance exams.

I did this same process again with the remaining SAT and ACT data sets, ultimately creating four new data sets. These data sets included information about each high schools' participation rates on each entrance exam and their participation rates in AP exams. Table 2 shows the number of high schools (and therefore cases) for each data set, as well as the number of AP Zeroes and invalid cases.

Table 2: Number of Cases, AP Zeroes, and Invalid Cases

Exam	Student Type	Number of Cases	Number of AP Zeroes	Number of Invalid Cases
SAT	Economically Disadvantaged	1,368	341	91
SAT	Not Economically Disadvantaged	1,405	353	50
ACT	Economically Disadvantaged	1,446	419	66
ACT	Not Economically Disadvantaged	1,456	404	63

Procedures

First, I wanted to figure out how AP exam participation varied by student type. I ran a frequency descriptive statistic for the Economically Disadvantaged AP SPSS file, showing the number of schools in each AP participation category by student type. The number, means, and standard deviation for each AP set are shown in Table 3.

Table 3: Mean and Standard Deviation for Participation in AP exams

Exam	Student Type	Number	Mean	Standard Deviation
AP	Economically Disadvantaged	1027	23.8	21.6
AP	Not Economically Disadvantaged	1052	32.7	22.3

Next, I ran descriptive analyses to compare means for each new data set. I used the compare means function, setting my transformed variable (AP Rate) as the independent list and Participation Rate (for the ACT or SAT accordingly) as the dependent list. After running that analysis for both exams and student types, I compiled the results. The data ultimately showed high school participation rates in ACT and SAT exams based on AP participation rate and student type. The means found in these analyses are the mean SAT or ACT participation rate for each student type. Since the AP participation rates were transformed into 11 different variables, there is one mean SAT or ACT participation rate for each AP participation category, as can be seen in the Chart 3 in results. The range of means is the difference between the highest and lowest SAT or ACT participation rate for each student type. The means and ranges of means for entrance exams can be found in Table 4.

Table 4: Means and Ranges of Entrance Exams

Exam	Student Type	Mean	Range of Means
SAT	Economically Disadvantaged	57.1	58.2
SAT	Not Economically Disadvantaged	57.8	55
ACT	Economically Disadvantaged	38.8	47.9
ACT	Not Economically Disadvantaged	51.5	36.9

Chapter 3

RESULTS

Chart 1 shows the number of high schools in each AP participation rate category for both disadvantaged and not disadvantaged student types. We can see that AP participation rates generally decrease for both student types, but high schools' disadvantaged students experience a steeper decrease. This difference is more clear in Chart 2, which shows the percent of high schools in each AP participation category out of the total number of high schools. 86% of high schools' disadvantaged students participate at a rate of forty percent or less in AP exams, as opposed to 70% of not disadvantaged students. Furthermore, 55% of high schools' disadvantaged students participate at a rate of twenty percent or less in AP exams, as opposed to 31% of not disadvantaged students. This shows that it is far more common for the not disadvantaged populations of schools to be taking at least one AP exam.

I generally found a positive correlation between participation in AP exams and participation in both the SAT and the ACT. Charts 3 and 4 show the means of these analyses for each AP participation group. The 0% AP participation category for the ACT exam analysis is an outlier in that it is higher than the .01-39.99 categories. On average, high schools' disadvantaged students took the SAT at about the same rate as high schools' not disadvantaged students, but they took the ACT at a much lower rate than not disadvantaged student populations. There is also a greater range in the average participation rates for the SAT exam than for the ACT exam, or range of means.

Chart 1: Number of High Schools for Each AP Participation Category by Student Type

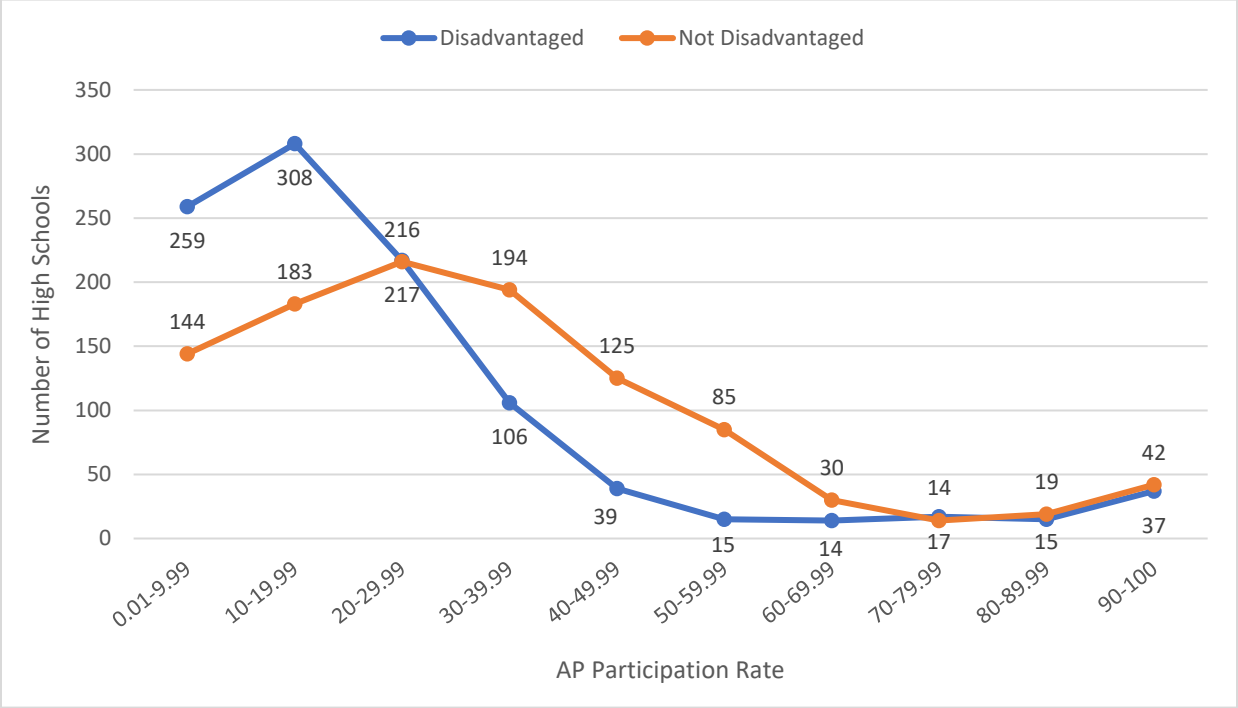


Chart 2: Proportion of Schools in Each AP Participation Category by Student Type

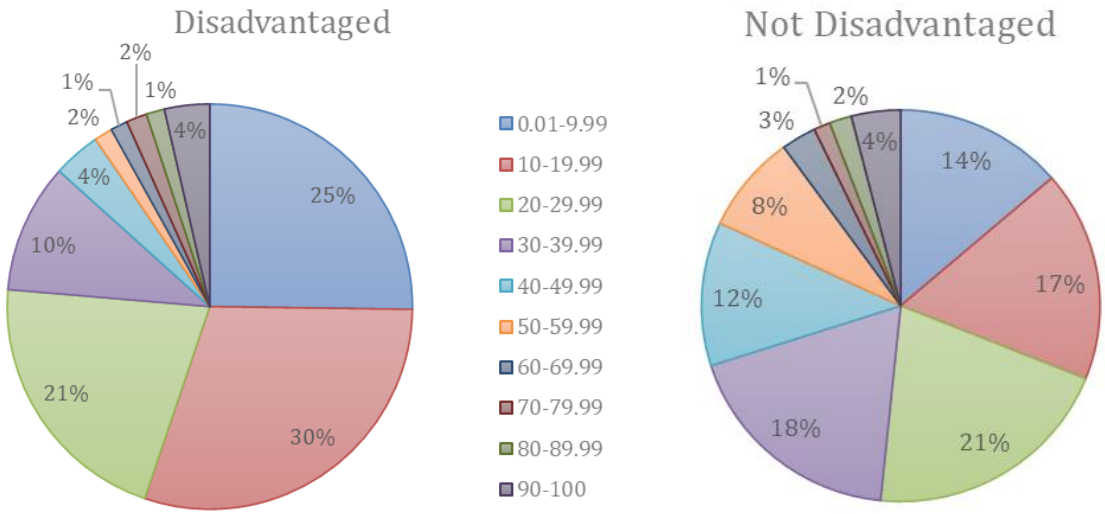


Chart 3: SAT Participation Rate for Each AP Participation Category by Student Type.

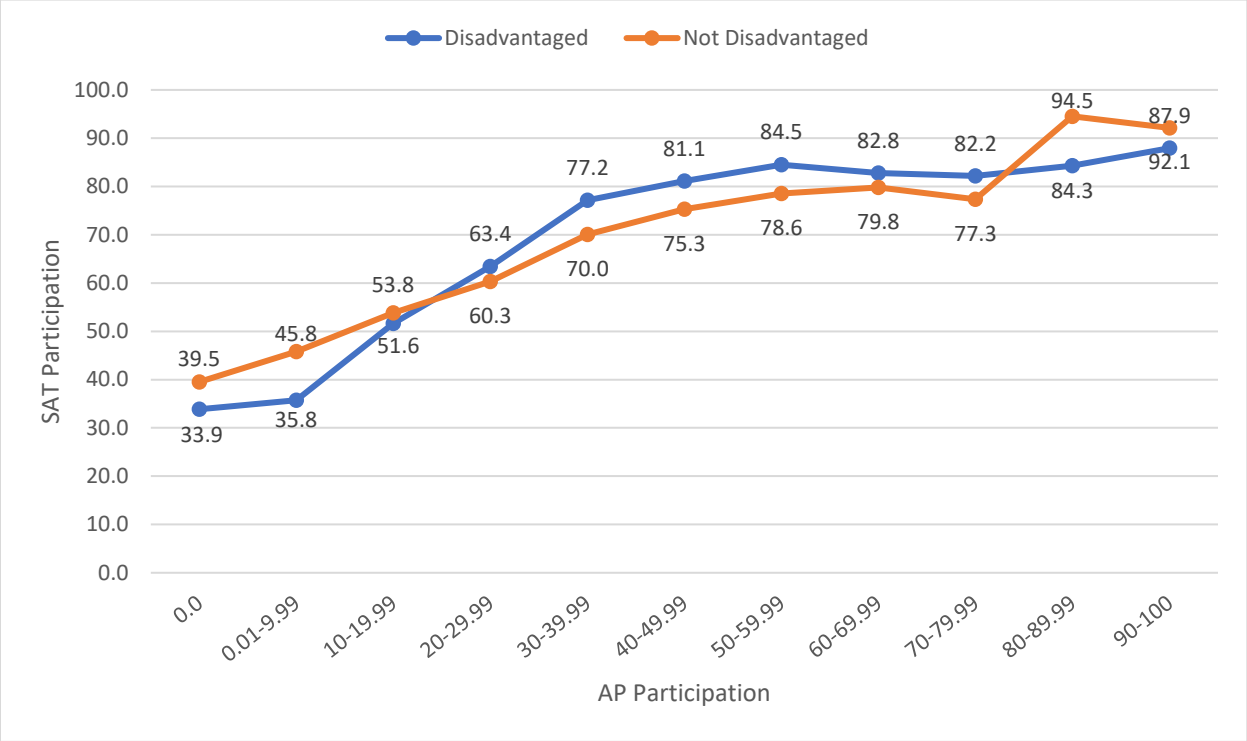
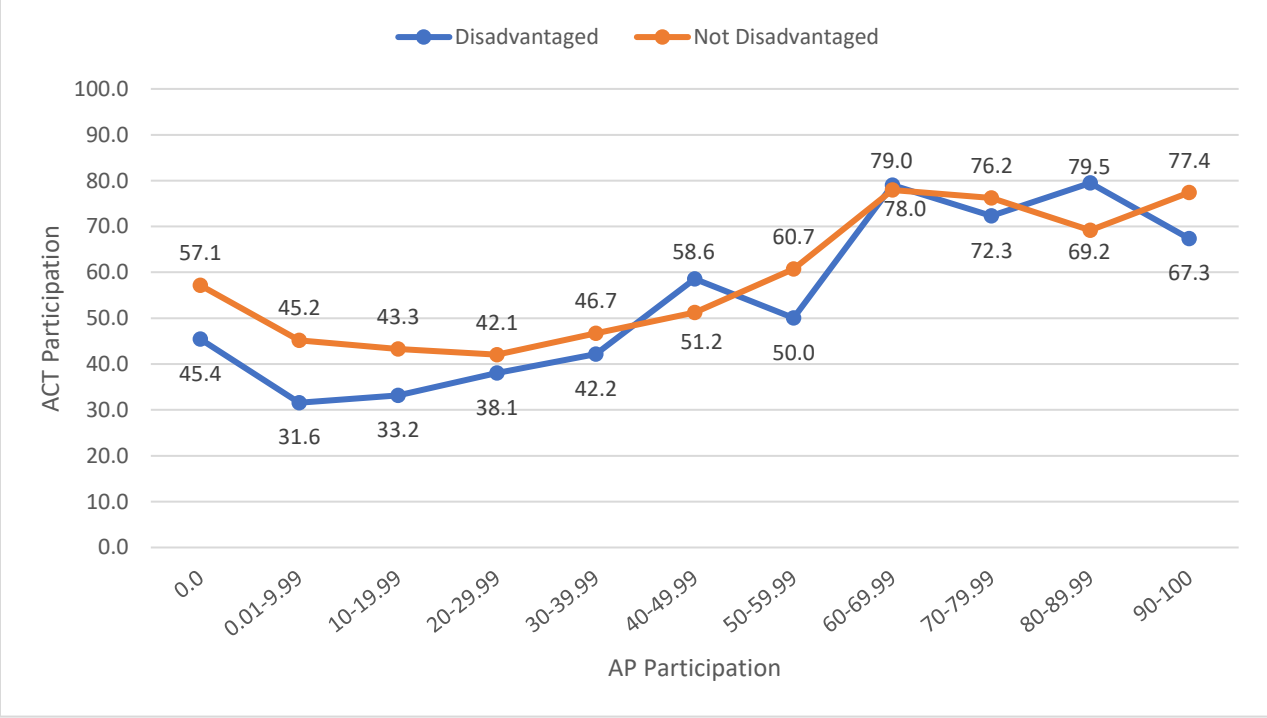


Chart 4: ACT Participation Rate for Each AP Participation Category by Student Type.



DISCUSSION

It is evident that disadvantaged students participate less in AP exams. Over half of the disadvantaged student population participates in AP exams at a rate of about 20% of students or fewer, as opposed to about one third of their not disadvantaged peers. There are various factors that could explain this disparity. First off, as discussed in the literature, teachers and counselors sometimes expect less of disadvantaged students, which could lead to fewer of these students taking AP courses. Since AP teachers are more likely to talk to their students about post-secondary education, a difference in participation in these courses perpetuates the lack of cultural capital already experienced by disadvantaged students.

We also know that the disadvantaged student population is partially comprised of first-generation college students. These students' parents likely have little to no experience with college-level courses such as AP courses, so they may be less likely to encourage AP class participation. This is an example of a disparity in social capital that, as discussed, can be overcome with high school counselors. High school counselors who have a close enough relationship with their students would be more likely to know if a student should take an AP level course. As research has shown, though, lower-income high schools have greater counselor-to-student ratios, so disadvantaged students who are eligible for AP courses are less likely to have a counselor that can encourage them to take these courses.

The ACT and SAT participation results are more complex. For SAT participation, high schools' disadvantaged students participated slightly more than not disadvantaged students when their AP participation rates were between 20-80%. Ultimately, the not disadvantaged student participation in the SAT was higher, but only by .7%. For each student type, there was a positive correlation between AP and SAT participation. Clearly, disadvantaged students who take AP

exams are also actively participating in SAT exams. Without AP exams, though, disadvantaged students took the SAT about 5.6% less frequently than their peers. While AP exam participation and SAT and ACT participation are positively correlated for all student groups, it seems that higher AP participation is correlated to higher SAT or ACT participation at a steeper rate for high schools' disadvantaged students.

High schools' not disadvantaged populations had higher participation rates in the ACT in nearly every AP participation group, and an overall greater participation rate in the ACT by 12.7%. Disadvantaged students are clearly less likely to take the ACT, regardless of AP participation, but it is unclear why disadvantaged student participation in the ACT is so much less than in the SAT. The AP Zeroes in the ACT analyses were an interesting outlier. Those high schools' students took the ACT at a higher rate than did high schools with AP student participation up to around 50%. Reasons for higher participation in ACT exams without AP participation are unknown.

The not disadvantaged student population had ACT participation rates that had an overall positive trended, but the rates were less consistent than the not disadvantaged SAT participants. For example, the greatest ACT participation for the not disadvantaged population was in high schools with between 60-70% AP participation rates. The disadvantaged students' ACT participation trended positively with AP participation at a more constant rate than the not disadvantaged population, but still not as consistently as those taking SAT exams.

It is clear that SAT and ACT participation are different when considering the impact of both AP participation and student type. There is a greater disparity between high schools' disadvantaged and not disadvantaged students populations' ACT participation than those groups'

SAT participation. There also seems to be less correlation between AP participation and ACT participation for both student types.

The relationship between AP participation and SAT or ACT participation does not necessarily mean that participation in AP exams actively impacts participation in the SAT or ACT. AP exams are meant to provide college-level credit. Most colleges require an ACT or SAT exam. Thus, it makes sense that students who plan to go to college are more likely to take both AP exams for college credit and ACT or SAT exams.

AP credit indicates preparedness for college-level courses in that subject. Thus, adequate AP access positively impacts college-readiness. For that reason, the disparity between participation in AP courses for disadvantaged students is a disparity that needs to be addressed. AP courses should be considered a vital resource that can narrow the inequality of college-readiness resources afforded to disadvantaged students. This holds true if AP access indicates greater participation in college entrance exams, as the trends in my analyses suggest. If the state of Texas funded well-educated AP teachers for every high school, perhaps by subsidizing income for those teaching at lower-income schools, this accessibility issue could begin to be addressed.

LIMITATIONS

My initial goal with this project was to analyze how well Texas education policies address disadvantaged student access to vital college-readiness and college-going resources. Reviewing policy and comparing high school requirements with college acceptance requirements in their totality is a huge task, and one that I was not equipped to fully undertake. Similarly, I have little experience with statistical software, which led me to answering fewer quantitative questions than I would have ideally liked to discuss.

Beyond my personal limitations, there were a few limitations with the data, as well. I initially found a huge data set with a lot of descriptive information about every school district in Texas that I wanted to use. This data set contained information about STAAR exam results, expenditures, teacher characteristics, average SAT and ACT exam scores, proportions of various student types, and various data points related to school wealth. I chose not to use this data set because it was at the district level, and not the individual high school level. Districts can be very diverse from one high school to the next, so a high school level analyses was more appropriate. Furthermore, the data sets I had at the school level were much more descriptive of different student types and their participation and performance on exams.

Even more accurate than high school level data would have been individual student-level data. Due to FERPA laws, those data were not available to me. Furthermore, I ultimately chose three data sets which were not representative of the same exact population of students. The ACT and SAT data sets included high school seniors from 2016-17, as opposed to the AP set which included Juniors and Seniors from 2017-18. The students in the SAT and ACT data sets were no longer in high school when the AP data were reported. I chose the most recent data sets for each exam and did not realize until later that the data were about different students. The AP data set

may have included more students per high school, too, since it reported on both Juniors and Seniors. This inconsistency between data sets is an issue, specifically regarding the analyses between AP participation and SAT/ACT participation. Regardless, my analyses are done at the high school level. Given the difference in timing is only by a year, the trends between data sets are likely still present, but the exact numbers will not be precise.

Despite a few inconsistencies and limitations, my research was meant to discuss AP courses as a resource that could positively impact disadvantaged students' post-secondary success. I also had the goal of pointing out discrepancies in access to AP exams. My singular AP data set showed a clear difference in disadvantaged student participation in AP exams when compared to their not disadvantaged peers.

SUGGESTIONS FOR FUTURE RESEARCH

As I researched the literature, I asked a lot of questions that I initially expected to answer with my data analysis. Ultimately, I did not answer most of them. High schools can provide vital resources to disadvantaged students, but many high schools will not provide these resources due to lack of funding or poor college-going culture. To better address these resources limitations, there would need to be much more research proving which methods of college preparation work best, especially for those who rely on their high schools to provide these resources. There are various areas in which further research would benefit disadvantaged students' access to post-secondary education.

The literature frequently discussed the gap between high school and college curriculum, which could be addressed by reforming high school curriculum expectations. What is the purpose of high school? In an academic sense, it is clearly the next step for a teenager before beginning college. 1/3 of students entering 2- and 4-year institutions take at least one remedial course (Chen and Simone 2016), so high schools are clearly not bridging the gap between high school- and college-level work. This is where a comprehensive study of End Of Course (EOC) testing expectations and requirements could be helpful.

The purpose of EOC exams is to test students' preparedness for the next course, but the only current indication of how that translates to post-secondary success is for Algebra II and English III exams. Mastering or Meeting the grade level for these two exams "indicates students are well [or sufficiently] prepared for postsecondary success," (Texas Student Assessment Program Interpreting Assessment Reports 2018:3.2). These exams could also be compared to SAT or ACT exams, since those two entrance exams are a relatively standard criterion of college

admission. Further, more general research into EOC exam requirements would be beneficial to understanding what policies Texas actively has in place to ensure postsecondary success.

Some high schools provide ACT or SAT prep courses. If more high schools gave students access to ACT or SAT exam prep, they might be more prepared for the exams. This is especially true for disadvantaged students whose families likely cannot afford to pay for these prep courses themselves. A study looking into the difference ACT or SAT exam prep courses make for disadvantaged students could highlight the importance of giving students access to these courses.

Getting to college is not the end of the story, and for many disadvantaged students, staying in college is as difficult as getting into an appropriate school. I have discussed various resources that make college more accessible to disadvantaged students, but more research needs to be done on how these resources impact success once in college, as well as graduation rates.

Many high schools in Texas regularly have big portions of their seniors attending the same post-secondary institutions. Researching this phenomenon might reveal patterns about when students from specific high schools attend higher-tier universities less frequently, and might ask, why? Do lower-income high schools have a lower rate of matriculation into the more competitive universities in Texas? Is there any correlation between high school income and what colleges they tend to feed into? If you go to a lower-income school, are you significantly more likely to end up at a university with lower graduation rates, thus making you less likely to graduate college? These are questions that I have, and questions that could lead to low-income high schools rethinking their approach to empowering students to be successful.

One variable I did not have time to explore was the 0 AP variable, or those high schools whose students took either the SAT or the ACT but did not take any AP exams. The number of

schools in that category was higher than I expected. There must be an explanation as to what high schools do not have AP exams, why they do not have them, and their relationship to ACT and SAT exam participation. This is particularly of interest to me for the schools where students took ACT exams but did not take any AP exams, because that population of students took the ACT at higher rates than a lot of schools who had AP exam-takers.

CONCLUSION

Disadvantaged students are often left behind due to a system that perpetuates inequality and lack of access. It is difficult to achieve upward mobility in the US, largely due to a higher education system that is difficult to navigate. My research involved one small factor of college readiness, and I found that disadvantaged students are less likely to participate in AP exams. This research is important. Higher AP participation encourages involvement in the post-secondary education system. It is vital to discuss how our post-secondary system fails those of us who have historically been left behind in order to change that broken system for the betterment of our society.

Access to AP exams and courses will not make every disadvantaged student a college graduate. It would, however, provide greater capital to those students by allowing them to succeed in college-level courses, as well as putting them in an environment where post-secondary education is commonly discussed and encouraged. There are numerous other resources that could have a similar impact, but the bottom line is, we need to address the systems that perpetuate class stratification and work to fix them. Being prepared to apply to, be accepted into, and attend college, and then succeed once there, should not be disproportionately feasible only for those who know the right people or can afford the right resources. College should be an option for anyone who decides that higher education is important for their future and career goals.

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